



WASHINGTON STATE
DEPARTMENT OF
E C O L O G Y

WOODWORKING / CABINETRY ENVIRONMENTAL COMPETENCY

DEPARTMENT OF ECOLOGY
HAZARDOUS WASTE AND TOXICS REDUCTION PROGRAM
PUBLICATION 97-410

printed on recycled paper



The Department of Ecology is an equal opportunity agency. If you have special accommodation needs or require this document in an alternate format, please contact the Hazardous Waste and Toxics Reduction Program at (360) 407-6700 (voice) or (360) 407-6006 (TDD).

WOODWORKING / CABINETRY

Environmental Competency

Ecology Publication #97-410

SECTION A: Environmental Management

A.1. Understand the Importance of Environmental Management in the Shop Setting.

A.1.1. Describe why it is important to properly manage all wastes.

Performance Objective 1: The student will be able to list some reasons why they must properly dispose of the wastes they create.

- 1) To be in compliance with the laws.
- 2) To avoid fines from regulatory agencies.
- 3) To protect themselves and others from injury and illness.
- 4) To avoid being liable for environmental cleanup.
- 5) To prevent pollution.
- 6) To be a responsible citizen.
- 7) To stay in business.

A.1.2. Know where hazardous waste regulations are found and what agency enforces them.

Performance Objective 1: The student will be able to cite the legal reference for hazardous waste management requirements.

LAW: Chapter 70.105 RCW, **Hazardous Waste Management Act of 1976**

REGULATION: Chapter 173-303 WAC, the **Dangerous Waste Regulations** (The regulation implements the law).

Performance Objective 2: The student will know which Agency enforces the regulations and provides technical assistance, and how to obtain a copy of the regulations.

The **Dangerous Waste Regulations** are enforced by the State Department of Ecology. They can provide you with a copy. Ecology provides assistance to keep businesses in compliance with the laws.

A.1.3. Understand the purpose of the “Waste Management Hierarchy”.

Performance Objective 1: The student will understand what the Waste Management Hierarchy is.

- The Waste Management Hierarchy was set by the legislature to encourage reduction and recycling of wastes instead of disposal.
- The purpose is to provide environmental protection by preventing wastes from being generated rather than controlling the wastes after they have been created.
- Being “in compliance” with the laws means you are doing what is required. The goal of the hierarchy is to think “beyond compliance”, to go the next step to eliminate, reduce, reuse, or recycle your waste.

Performance Objective 2: The student will understand the methods of handling waste in the preferred order, and provide an example of each.

Waste Reduction - To not create a waste in the first place.

- Scheduling paint jobs by color to reduce spraygun cleanup.
- Switching from chlorinated to non-chlorinated cleaners and solvents.
- Mixing only enough paint for the job.
- Extending the life of paint thinner by settling solids and decanting the liquid for reuse.

Recycling - Reclaim or reuse the waste.

- Using shop towels that are laundered by a permitted laundry.
- Recycling spraygun solvents in a closed, recirculating gun washer.
- Recycling cleaning solvents in a solvent distillation unit (if allowed by the local fire department.)

Treatment - To perform a process on the waste to eliminate its hazards or prepare it for disposal.

- Evaporating latex wash water to reduce it's volume.

Incineration - To thermally destroy a waste in an approved incinerator.

- Sending hazardous waste to a facility to be thermally destroyed.

Landfill - To put into an appropriate landfill.

- Sending hazardous waste to a designated Hazardous Waste Landfill.

Performance Objective 3: Given waste streams typical of the shop, the student will be able to determine if there is a more environmentally sound way to manage the waste.

Performance Objective 4: The student will be able to articulate why waste reduction is the highest priority.

Land disposal and incineration of wastes can be harmful to the environment and costly for the generator. By reducing the amount of waste produced, you can:

- 1) Protect the environment and human health
- 2) Save money
- 3) Reduce your financial liabilities
- 4) Avoid some regulations

A.1.4. Understand what is meant by the term “pollution prevention”.

Performance Objective 1: The student will be able to articulate what “pollution prevention” means and provide general examples.

Pollution prevention is any method of reducing the amount of toxic materials used or released to the environment. It can be accomplished by:

- Replacing toxic materials with less toxic or non-toxic substitutes.
- Changing a process so a hazardous material is no longer needed.

A.1.5. Understand why pollution prevention is desirable.

Performance Objective 1: The student will be able to articulate how pollution prevention can benefit business, employees, and the environment.

- Reducing or replacing toxic materials reduces exposure to harmful substances, creating a healthier, safer workplace.
- By preventing wastes from being generated, you reduce hazardous waste management and disposal costs and liability.

A.2. Understand the basic waste management elements which are required by law for waste accumulation areas, containers, and labeling.

A.2.1. Describe the key requirements of waste accumulation areas.

Performance Objective 1: The student will be able to describe the key required elements of a waste accumulation area.

Waste accumulation areas must:

- Be well defined
- Be well marked with warning signs
- Have secondary containment

Performance Objective 2: The student will understand what secondary containment is and determine if it is sufficient in a given waste storage situation.

Secondary containment:

- Waste storage areas must have the ability to contain spills from tipped, overfilled, or ruptured containers.
- The containment must be able to hold 10 percent of the capacity of all stored containers or 110 percent capacity of the largest container, whichever is greatest.

A.2.2. Identify the basic waste container management requirements.

Performance Objective 1: The student will be able to identify the basic waste container management requirements.

- 1) Must be *suitable* for the waste
- 2) Must be in good *condition* and able to hold the waste
- 3) Must be kept *closed*
- 4) Must be *labeled* as hazardous waste
- 5) Must be *labeled* with the appropriate risk warning.

Performance Objective 2: The student will be able to determine if a container is appropriate for a given waste stream.

1) Suitability

Type of Waste:

Waste Solvent

Waste Corrosives

Waste Acids

Appropriate Container:

Metal container

Plastic container

Plastic container

2) Condition

Appropriate:

Clean

Can hold the waste

Not Appropriate:

Contaminated with other waste

Cannot hold waste due to: Sprung seams
dents, holes, rust

Performance Objective 3: The student will be able to demonstrate how to close and label a container.

1) Keep Closed: Containers must be kept closed except when emptying or filling.

- The bung should be screwed in tightly.
- Ring lock, if present, should be closed securely to avoid leaks.

- Funnels should be removed except self-closing ones.

2) *Labeled:* Waste containers must be labeled with:

Information on label:

Dangerous waste
The type of waste described
The hazards listed

Example:

“DANGEROUS WASTE”
“USED LACQUER THINNER”
“FLAMMABLE”

A.3. Understand what the requirements are for spill prevention and cleanup.

Performance Objective 1: The student will be able to articulate the key elements of a spill response plan.

- Instructions on what to do when hazardous materials are spilled
- Who to notify
- The type of personal protection equipment needed
- The location of the spill cleanup supplies
- How to neutralize spills, if possible
- How to dispose of the wastes after cleanup
- How to prevent spills from occurring

Performance Objective 2: The student will be able to demonstrate what to do in case of a large spill of hazardous material.

- Locate and properly use spill response materials
- Contain the spill
- Contact the proper authorities
- Clean it up
- Manage the wastes properly

SECTION B: Woodworking Waste Management

B.1: Understand what hazardous wastes are produced in woodworking and how to dispose of them.

B.1.1. Understand the hazardous wastes produced in woodworking and the dangers they pose.

Performance Objective 1: The student will be able to identify the common dangerous (hazardous) wastes that come from woodworking and the hazards they pose.

<u>Dangerous Waste</u>	<u>Hazard</u>
Waste adhesives	Typically flammable, possibly toxic
Waste solvent	Typically flammable and toxic
Waste coatings	Typically flammable and toxic
Waste stains	Typically flammable and toxic

B.1.2. Understand the various methods used to safely dispose of hazardous wastes.

Performance Objective 1: The student will be able to identify the appropriate handling method for dangerous wastes from woodworking.

<u>Waste</u>	<u>Appropriate handling method</u>
Adhesives	If still wet, handle as hazardous waste and send to proper disposal facility. If dry, can be disposed as solid waste.
Solvents	Send to recycler; if no recycler available, then send to proper disposal facility. Can be recycled in a carefully managed on-site distillation unit.
Coatings	Waste solvent-based coatings are dangerous waste and should be sent to a proper disposal facility. Evaporation is not proper disposal.
Stains	Waste solvent-based stains are dangerous waste and should be sent to a proper disposal facility. Evaporation is not proper disposal.

B.1.3. Identify ways that hazardous wastes can be reduced.

Performance Objective 1: The student will be able to identify ways in which the generation of hazardous wastes can be reduced.

<u>Waste</u>	<u>Reduction practices</u>
Adhesives	<ul style="list-style-type: none">• Only use amount needed.• Use non-hazardous or less toxic adhesives when possible• Keep lid on adhesives closed when not in use• Purchase and use pre-laminated materials where possible
Solvents	<ul style="list-style-type: none">• Re-use solvent as much as possible• Open solvent containers only when in immediate use• Rinse brushes in “dirty” solvent, then final rinse in small amount of “clean” solvent• If at all possible, use “dirty” solvent to thin coatings instead of using fresh thinner• Recycle solvents by distilling on-site in a carefully managed still.
Coatings & Stains	<ul style="list-style-type: none">• Only purchase amount of coating needed for job• Use less toxic coatings wherever possible• Apply coatings efficiently to reduce overspray losses• Use rollers or brushes when possible

B.2. Understand what cross-contamination of woodworking waste is and how to avoid it.

B.2.1. Define “cross contamination” and why it is undesirable.

Performance Objective 1: The student will understand what is meant by “cross contamination” and be able to provide reasons why it is undesirable.

Combining a waste with a different waste will cause the mixture to be more difficult to manage, almost impossible to recycle or reuse, or more expensive to manage. It could even cause a chemical reaction that could produce an explosion or toxic gases.

Mixing an exempt waste or a solid waste with a hazardous waste will cause the whole mixture to be classified as a hazardous waste, and subject to the regulations.

B.2.2. Describe common occurrences of cross-contamination.

Performance Objective 1: The student will be able to give examples of common occurrences of cross-contamination

- Paint thinner mixed with old paint.
- Oil-based wastes and water-based wastes mixed.
- Wood waste mixed with other solid waste.

B.2.3. List management practices to avoid cross contamination.

Performance Objective 1: After understanding the definition of cross contamination and giving several examples of it, the student will be able to describe how to avoid cross contamination of wastes.

- Paint thinner and waste paint should be kept separate. Thinner may be recycled.
- Mixing the wastes causes the whole mixture to be a dangerous waste, resulting in higher disposal costs.
- Keep oil-based and water-based wastes separate.
- Keep wood wastes separate for recycling.

B.3. Understand what wastewater is, where it is generated, and how to manage it appropriately.

B.3.1. Define wastewater.

Performance Objective 1: The student will be able to define the term “wastewater”.

Wastewater is water that has been used for a purpose, but is no longer usable for that purpose, and will be disposed of. All process wastewater should go to a sewer and not to any other type of drain.

B.3.2. Identify the common wastewater discharge destinations and which wastewater can be disposed to each.

Performance Objective 1: Name the common wastewater discharge points and the appropriate wastes that can be discharged to each.

Discharge point:

Sanitary sewer
Septic system
Storm drains
Combined storm/sewer*

Dry well

Wastewater allowed:

Industrial process waters, sewage; floor wash water.
Sanitary sewage, domestic wastewater.
Uncontaminated stormwater, rainfall, snowmelt.
Treated stormwater, rainfall, snowmelt, industrial process waters and sewage.
Treated stormwater, rainfall, snowmelt.

(A combined drain system allows for stormwater to be collected and run to the sewer. It is a sewer system with some storm drains linked to it. At no time is sewer water allowed to go to a storm drain.)*

B.3.3. Identify common water-borne pollutants created through woodworking and the proper disposal method.

Performance Objective 1: The student will name one way that water-borne waste is created and proper disposal methods.

Process: Brush Cleaning: Rinsewater from brushes that were used for water-borne coatings.

Discharge to sewer.

Water left from cleaning latex paint off of brushes should only be disposed to the sanitary sewer (not storm sewer). If no sewer at off-site location, wash water should be brought back to the shop and discharged to the sewer there. *(If too inconvenient, let solids settle and decant water in a discreet area over grass or compacted soil. Solids can dry and go to the landfill).*

Floor drains should only be used for disposal if they are directly hooked up to the sanitary sewer or to a sump. Wastes should **never** be discharged to storm drains, dry wells, CSO's (combined sanitary/storm sewers), floor drains where the outfall is not known, or septic systems.

Evaporation

Washwater can be left to evaporate. Most solids from water-borne coatings are non-hazardous and could then be landfilled.

B.3.4. Identify ways in which wastewater can be minimized.

Performance Objective 1: The student will be able to list four ways in which wastewater generation can be minimized. (Note that other wastes are often generated by some of these alternatives.)

- Use disposable brushes and rollers.
- Plastic-wrap brushes or rollers at the end of the work day and store in a refrigerator over night.
- Dedicate brushes, rollers, or spray guns to one color/type of paint.
- Rinse initially in a large bucket of “dirty” water, let water evaporate and landfill solids.
- Keep gun nozzles clean.

B.3.5. Identify wastewater discharge criteria to sewers.

Performance Objective 1: The student will list three situations when a wastewater may not be discharged to a sewer without treatment prior to disposal.

Wastewater may not be discharged if:

1. It exceeds the treatment plants discharge limit on **fats, oils, and greases**.
2. It exceeds the acceptable **pH range**, either higher or lower
3. It designates as a **Dangerous Waste**.

B.4. Understand types of air-borne wastes generated in woodworking and how to minimize them.

B.4.1. Identify common air-borne pollutants created during woodworking.

Performance Objective 1: The student will be able to list three types of air-borne pollutants.

- Fugitive dust from sawing, sanding, and milling.
- Solvent evaporation (VOC's) from adhesives, thinner, cleaners, coatings.
- Overspray of coating solids.

B.4.2. Identify ways in which air-borne pollutants can be reduced.

Performance Objective 1: The student will be able to identify five ways to reduce air pollution in the shop.

- Use dust collection equipment, ventilation, isolation of areas using drop cloths.
- Scraping and planing instead of sanding when possible.
- Keep solvent/stain/adhesive/coating containers closed at all times.
- Use least toxic chemicals.
- Keep spray guns in good condition.
- Use good spraying technique and configure substrate efficiently.
- Roller or brush apply when possible.
- Use HVLP guns

B.5. Understand types of solid wastes generated in woodworking, proper disposal, and minimization

B.5.1. Identify the types of solid waste produced.

Performance Objective 1: The student will recognize which wastes are considered solid waste.

- Scrap lumber (treated and untreated)
- Sawdust
- Shop towels

B.5.2. Understand proper disposal of solid wastes.

Performance Objective 1: The student will understand how to properly dispose of solid wastes.

<u>Solid Waste</u>	<u>Appropriate disposal method</u>
Scrap lumber	Use for small projects; find wood recycler
Shop towels	Use an industrial laundry service

B.5.3. Understand ways in which solid waste production can be minimized

Performance Objective 1: The student will be able to describe various ways to reduce solid waste.

- Good construction techniques
- Proper selection of materials
- Check measurements before cutting
- Efficient design layout
- Re-use scrap lumber wherever possible
- Always cut from the smallest piece your part will come from

Environmental Competencies

- - - Evaluation - - -

Dear Vocational Instructor: In order to improve our services, the **Department of Ecology** asks you to please complete this evaluation on the environmental competencies you have used. We will use your comments for future revisions. **THANK YOU !**

This evaluation is for the environmental competency in (Circle):

AUTO REPAIR AUTO BODY DENTAL PHOTO
WOODWORKING

Ranking: Level of satisfaction / agreement: 1 = Low 5 = Average 10 = High

1). The information in this competency is appropriate for the students.

1 2 3 4 5 6 7 8 9 10

2). The level of detail was sufficient for me to teach it.

1 2 3 4 5 6 7 8 9 10

3). The supplemental materials answered most of my questions.

1 2 3 4 5 6 7 8 9 10

4). It was easy to incorporate the competency into the curriculum.

1 2 3 4 5 6 7 8 9 10

5). The layout was clear and easy to use.

1 2 3 4 5 6 7 8 9 10

6). It is important for students to learn about environmental management.

1 2 3 4 5 6 7 8 9 10

7). "I have incorporated this information into my curriculum."

1 2 3 4 5 6 7 8 9 10

8). Additional comments, or suggestions: _____

9). Requests for additional info: _____

10). **Name & Program:** _____

School: _____

Send to: Patricia Jatzak, Dept. of Ecology, P.O. Box 47600, Olympia, WA 98504-7600 Or FAX: (360) 407-6715
